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KNOWLEDGE IS POWER--HAPPINESS--VIRTUE.

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Recapitulation.—The class of *primary* rocks was described in my last article. They are the deepest in situation, and project in many places so as to form the central part of mountains. Their structure is crystalline, evincing the agency of fire or of water in their production. They contain no relics of animals or plants—their origin being supposed prior to the existence of living things. The most important of them is *granite*, so called from its granular structure—composed of *quartz*, *feldspar* and *mica*. *Quartz* is very hard, scratches glass, strikes fire with steel, when pure consists of *silex*, and is often colored with iron or manganese, forming amethyst, agate, jasper &c. It is used for making glass, and for many other purposes. *Feldspar* is not quite so hard, mostly reddish or white, and always breaks into rhomboidal fragments. It is used in the manufacture of porcelain. *Mica*, sometimes called isinglass, occurs mostly in flat plates, and is separable into very thin, transparent and elastic laminæ. It is sometimes used as a substitute for glass.

Graphic Granite.—I have stated that one of the ingredients of granite is often wanting. The mica is most frequently absent, and the rock is then more valuable for the purposes of architecture. The quartz is sometimes so mixed with the feldspar, as to present, on the fractured surface of the rock, the appearance of Hebrew characters. To this variety, the name of *graphic* is applied, for a reason which my readers will easily discover.

Architectural uses of Granite, and its durability.—Being exceedingly hard, it is well adapted to the purposes of building. The Bunker hill monument, and many edifices in our country are made of it. The Ionic columns of the Roman forum, and the obelisks of Rome, were built of granite brought from Egypt. The Egyptian pyramids are constructed of the same material, on which the mouldering hand of time has been for ages exerted in vain. For although those lofty structures have been exposed to the winds and storms of 2000 years, they yet remain, stretching to a giddy height their massive forms, and still exhibiting, with all their original distinctness, the hieroglyphics of the Egyptian sculptor.

Soft Granite.—In Cornwall, England, there is a singular kind of granite, which is soft enough, when first taken from the quarry, to be easily sawed into slabs; but on exposure to the air, it soon becomes very hard. Some varieties of limestone exhibit the same remarkable property.

Aspect of granitic mountains.—The aspect of mountains of granite is extremely various. Their summits are sometimes rounded, heavy and unpicturesque, and in other cases they resemble a mass of ruins piled confusedly together. Every body has read something of the scenery of the Alps, which consist principally of granite. In the vicinity of Mount Blanc, it forms lofty pyramidal peaks or *needles* as they are termed, which rise in enormous spires. One of these *needles* stretches, nearly to a point, in one solid shaft, more than 4000 feet high; and the pinnacle of this spire is 11000 feet above the level of the sea.

Ascent of Mount Blanc, by Saussure.—Mount Blanc is the highest granitic mountain that has ever been examined. The only valuable description of it has been given by Saussure, who ascended it twenty years since. Owing to the difficulty of the ascent, it required eighteen hours of continued labor, exclusive of the time necessary for repose and refreshment, to reach the summit, from the beautiful valley of Chamouni, at its base, a distance not more than eight miles; so that while our traveller was on his journey, he moved at the average rate of nearly half a mile in an hour. The first day's journey was comparatively easy, but the ascent on the second day was on snow and ice. In the afternoon of this day, Saussure and his companions pitched their tents on the second of the three great plains of snow they had to traverse. Here they passed the night, 3100 yards above the level of the sea, and 200 yards higher than the peak of Teneriffe. The barometer stood at seventeen inches, thirteen inches lower than the common measurement of our atmosphere. The next morning they proceeded with much difficulty and fatigue, arising principally from the extreme rarity of the atmosphere, which impeded their respiration, and reached the summit at eleven o'clock. Here they were on the highest point of land in Europe, and in all probability were at this moment farther from the centre of the earth than any other human beings. They were two miles above the line of perpetual frost and snow, and although far beyond the reach of clouds, and exposed to the full splendor of an unclouded sun, the prospect around them was cheered by no plant or animal; not a single living thing besides themselves did their eyes behold.

Summit of Chimborazo volcanic.—Although Chimborazo is more than a mile higher than Mount Blanc, yet granite is not found at so great a height upon it as upon the latter mountain. The tops of the Andes are composed of volcanic products, that have been ejected so as to cover the granite, and add greatly to their height. The summit of Chimborazo is a vast cone, composed, according to Humboldt, of regular and immense columns, which strike the eye of the traveller like the ruins of enormous castles lifted into the sky.

Neptunian and Plutonian Theories of the Earth.—I have before remarked, that granite is supposed by one set of geologists, to be the effect of the action of fire. By another portion, it is attributed to crystallization, from a solution in water. While the former class believe that granitic mountains owe their existence to a force applied beneath, so as to uplift the strata from their horizontal position, the latter ascribe the same inequalities to the peculiar manner in which the primary rocks have crystallized, like alum and other chemical salts. The latter theory, is that which the German, Werner, advanced; and the former has been advocated chiefly by Dr. Hutton, of Edinburg. As Werner was so much afraid of fire, and Hutton was not able to make the world without it, these rival theories have been respectively named after Neptune and Pluto, the former of whom was once the proprietor of the ocean, the latter presiding over the land and the regions of fire. Geologists of the present day, are all ranked under one or the other of these theories, the Neptunian or Plutonic, either in their original form, or with modifications adapted to their particular views.

Importance of facts in examining these theories.—The merits of these two theories will furnish an interesting subject of inquiry at a future period. In the mean time, as nearly every fact in relation to the rock strata has a bearing on the question, it may be well for my readers to examine, as we pass along, whether the facts stated are best explained by the watery or by the igneous hypothesis; or in case of the failure of both these, they may be left at liberty to invent some other way of accounting for geological phenomena; and propound some new theory of the earth.

Argument founded on granitic needles, and on hot springs.—To illustrate my meaning, I will offer a few examples. The advocates of water present to their opponents the granitic needles just now mentioned, and challenge them to account for their origin by any convulsion of nature produced by fire; whilst themselves find an easy solution of the problem, in the peculiar manner in which crystals are known to form in a saline solution. On the other hand, the advocates of fire discover that the Alps, the Andes, and nearly all the large mountains, are bordered by many hot springs; which they adduce to prove the immense reservoir of heat in the interior of the earth.

Argument founded on mineral veins.—There is another phenomenon of fre-

quent occurrence, which is seized on with avidity by both parties, to support their favorite doctrines. I allude to the *veins* or seams that intersect the rock strata. These are mostly composed of some other rock than that through which they pass. Thus veins of granite often extend upward, like perpendicular walls, into the superincumbent strata, occupying crevices or fissures in the latter, which appear to have been produced by some violent force, competent to break the strata. The Wernerians suppose these veins to have been filled from above, by the melted matter being poured into the crevices. But the Huttonians say, the cracks were made by the operation of fire underneath, and that the rock solution was subsequently thrown up into these fissures from the melted mass below. S.

For the Advocate of Science.

A Lecture on the History and Study of the Natural Sciences.

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So long as the minds of men were dazzled by these discursive flights of fancy, so long was nothing added to the stock of true geological knowledge. At length, however, Germany gave birth to a genius from whom alone we can date the commencement of real geology. This was Professor Werner, of Freyburg, who published his system towards the close of the last century. Werner began his career by a careful and laborious examination of the strata around his native place; and upon the knowledge thus acquired, he created the system which bears his name. His antipathy, however, to the mechanical part of writing, which in some instances was carried to a laughable excess, prevented him from publishing, except on one or two occasions. It is said that nothing could finally induce him to write a line; and to avoid reproaching himself with want of politeness, he at last would not open the letters addressed to him; so that when the French Academy placed him among its eight foreign associates, an honor coveted by the most illustrious philosophers of Europe, he became acquainted with his honors through an almanac. An express which his sister had sent to him from Dresden, waited two months at an inn, at his expense, in order to procure his simple signature to some very pressing family concerns. He had committed his system to the press, but not willing to endure the fatigue of correcting the first proof sheet, this task was left to his students. Method was his hobby. He was exceedingly fond of dividing and classifying: and latterly bought books, not to study, but to arrange them in a certain order in his library. He is said to have debated alike on the order of his dinner table, and on the arrangement of his cabinet, and even traced the military art by the laws of geology. A man, said he, who wishes to become a great general, should begin his education by studying oryctognosy and geognosy at Freyburg. His great error was in supposing that Saxony and Bohemia were the world in miniature; and hence he believed he had there seen all that the world afforded. Nevertheless, the untiring zeal of Werner, and his laborious examination of *things*, gave him undisputable claims to the title of the father of practical geology.

For the present, suffice it to say of the system of Werner, that the German philosopher believed the strata which compose the surface of our globe, to have been deposited from a state of solution or suspension in water. Following his example in regard to the study of facts, many other practical geologists of celebrity have since arisen, some of whom, however, maintain the doctrine that most of these strata formerly existed in a state of solution by fire. Of the latter class the most conspicuous is Dr. Hutton, of Edinburg. The respective theories have assumed the names of their chief advocates, and are frequently styled the Wernerian and Huttonian systems.

Having sketched the leading features of the history of the natural sciences, let us now direct our attention to the sciences themselves. Let us inquire what they propose to teach us, and whether the great temple of nature is rich enough in objects of entertainment and instruction, to reward us for devoting to the examination thereof, an occasional hour, which might else be idly, or worse than idly spent.

Of the extensive and almost infinitely diversified series of objects, here presented to our view, the first and most important is our own species. Whether we regard man in a physical or moral light, the investigation of his nature and attributes, is replete with interest and instruction. We find some philosophers tenacious of the privilege of being considered entirely distinct from the lower orders of animals; whilst others expatiate with much delight on the close connexion of the various objects of the three kingdoms, like the steps of a staircase, or the links of a chain, and represent man only as a more perfect kind of monkey. It has even been asserted, that man and the monkey belong to the same species—that the father of the human race was an ourang outang, and of course, that our primeval ancestors were so undignified as to walk on all fours; and that, by a law of nature, to escape which would have been a painful operation, they were adorned with tails: that at length, tails becoming unfashionable, gradually disappeared, or were suddenly dropped in one variety of the species, constituting the improved figure of our present man. Such notions as these were not advanced by way of satire and burlesque, but were maintained in sober earnest, and defended with much erudition and zeal. A celebrated character of the last century possessed the drawing of a man with a tail, which he highly prized, believing it a correct representation of one of the last of our tailed ancestry.

In descending from man to the lowest orders of animals, we observe that organization gradually loses its complex and perfected nature, until it becomes finally so simple as hardly to exhibit the phenomena of life. The first grand division, including all that are furnished with the vertebral column of bones along the back, extends from man to the eel and serpent, in which this column becomes a mere cartilage. The arms and legs are more imperfect as we descend, until fins supply their place; and ultimately, at the very extremity of the scale, even these means of locomotion are not present. In the next division, of molluscous, or soft bodied shell animals, extending from the cuttle fish to the oyster, there is no bony skeleton: the blood is neither red nor warm; the organs of voice cease to exist; the eyelids, the apparatus for the secretion of tears, and the organs of touch and taste, are wanting: and in some, there is no power of locomotion, the animal attaching itself to a rock or piece of wood, and remaining there like a vegetable. Descending still farther, to the articulated or jointed animals, comprising the lobster and the common earth worm, we find all the organs of sense gradually extinguished, and the heart and respiration wanting. Lastly, in the radiated department, extending from the star fish or medusa, which illumines the waves of the ocean by its phosphorescence, to the eels of the vinegar cruet, or the still more imperfect infusory animalculæ, we observe that every kind of circulation is abolished; and at the ultimate point of the scale, the animated being appears to our senses like a spot of mere jelly.

In contemplating this extensive range of animated existence, we are at once struck with the extreme diversity in the size, form, structure, habits, of the objects embraced thereby. Compare the little inhabitant of mouldy cheese, or the equally diminutive monad of the vegetable infusion, both invisible without the aid of artificial means, with the huge elephant, or the enormous whale. Not more extensive is the boundless domain of the vasty deep to the one—not more extensive the far spread forests of Asia to the other, than the handful of water in the flower vase, or the patch of mould on the cheese, to their respective tenants. Compare the winged ephemera, whose gay infancy commences with the rising sun, whose active youth and mature season of life are gone by at the hour of noon—whose fluttering existence is terminated with the close of a decrepid,

and enfeebled old age, all before the day star that dawned upon his birth has once set in the west—compare *him* with the lordly possessor of a soul, whose hair is scarcely silvered with age, until the winters of four score years have passed o'er him—who is not gathered to his long home until those creatures of a day, to which he is so often likened, have flown through thrice ten thousand generations.

There is scarcely any situation not adapted to the support of animal life in some one of its varied forms. The common water lizard has been found imbedded in masses of ice, in a state of torpidity, from which it perfectly recovered when thawed; and the common eel, when equally frozen and torpid, is often carried from St. Petersburg to Moscow, a distance of 1000 miles, and there may be entirely restored to life and activity. On the other hand, fishes have been found in a hot spring in one of the Manillas, the water of which was at a temperature of 158 degrees; and Humboldt observed other fishes thrown up alive, and apparently in perfect health, in the water of a volcano, the temperature of which was 210°; only two degrees below the boiling point. The eggs of the common blow fly are said not only to withstand a heat of 400 or 500°, in the broiling of meat, on which they have been deposited, but to be actually quickened by this temperature into the grub or larva state. Some animals are adapted to the sandy desert, by the absorbing power of their skin, which renders unnecessary the susception of water in the stomach. Thus the ostrich is said never to drink, and the sloth even trembles at the falling of rain. Some spend their lives totally submersed in water, or buried in the caverns of the great deep. Others are fitted for the upper regions of the atmosphere, where the air is by far too rare to support human life. Humboldt saw the majestic condor of the Andes, dart suddenly from the bottom of the deepest vallies, to a considerable height above the summit of Chimborazo, where the barometer must have been lower than 10 inches, and the air consequently not one third as dense as that we breathe. This enormous vulture has the cavities of his bones uncommonly large, and like those of other birds, filled with air, in order to render them more buoyant. For the same purpose, and in order to facilitate their motions in the water, the whale and seal are furnished with a stratum of light fat, or blubber, beneath the skin.

EMBALMING.

The practice of embalming the dead, which is of very ancient origin, appears to have been a national peculiarity rather than a general rite among the ancients: and however good may have been the reasons of the Egyptians for observing it so long and so extensively, the more philosophical spirit of later ages has not seen proper to perpetuate a custom so inconsistent in every respect.

It was a belief inculcated by the religion of the Egyptians, that the existence of the soul was coeval with that of the body. Hence it was their desire to preserve the latter entire as long as possible, that the former might enjoy a protracted being in a spiritual world. In nothing did they lavish their wealth so profusely, as in the prosecution of this grand scheme. And all the care they could exercise, and all the art they could command were called in requisition, while prepareing the dead for their sephulchral home.

As before said, embalming was practised at a very early age. We find Joseph gave directions to the physicians to embalm his father. And Joseph died 110 years of age, and he was embalmed. At what time the practice began to decline, is not certainly known, but it is supposed to have been quite prevalent 1000 years ago.

The principle of embalming depends either on the absorption of the fluids of the body, or impregnating them with substances which will preserve them from putrefaction. The Egyptians made use of three methods, the most expensive of which cost a talent, which is something more than 1500 dollars. From this price it decreased to a very small amount, commensurate with the means of the poorer class of inhabitants. The period required for the operation varied from seventy to thirty days. Among the rich, the brain was first extracted, and the cavity filled with balsamic ingredients. The abdomen was laid open, and after the intestines were removed, it was cleansed with wine and odoriferous substances, of which they were no ways sparing, and the cavity filled with aromatics, after which the body was deposited in nitre for seventy days.

When taken out, it was washed, and swathed in linen smeared with gum. The linen was first wrapped round each limb separately, then round the whole body. The quantity they used is almost incredible; and according to Belzoni, its quality was such as leads us safely to infer, that linen manufactories were brought to as great perfection among the ancient Egyptians as they now are among us. Not less than 500 yards were used in wrapping up the body of one person; and according to some accounts a thousand were frequently employed. This operation being completed, the body was given to the relatives of the deceased, entire in all its features, the very hairs of the eyelids being preserved. They placed it in a wooden case, made of the sycamore tree, and shaped like the human body. Leaves and flowers of acacia are often found round the body, and sometimes lumps of asphaltum weighing as much as two pounds. On the cases of the opulent are engraved hieroglyphics, supposed to be accounts of their lives; while the bodies of the poorer class are accompanied with pieces of papyrus, on which, Belzoni thinks, a similar account was written. Their tombs are highly magnificent, having figures in the different apartments representing the different actions of life, such as agricultural operations, religious ceremonies, feasts and funeral processions; these last being generally predominant. Thus could the Egyptians behold the faces of their ancestors, who had died ages before they themselves were born, and take as much pleasure in the sight, as if they were holding converse with their living friends.

Another method of embalming, was by throwing oil of cedar into the body, and letting it lie seventy days in nitre. The oil brought away the intestines by expulsion, and the nitre consuming the flesh, left nothing but skin and bones. After this operation, it was enveloped in linen, as in the former case. Another, was by washing the abdomen with certain lotions, and leaving the body to dry seventy days in salt. Diodorus mentions thirty days as the period in which a body might be embalmed.

In a mummy which Dr. Hadley examined, he found the face covered with a varnish, or glazing substance, the teeth complete and perfectly beautiful, being thirty two in number. The mouth was filled with an odoriferous dust, and the nostrils stopped with cotton and a kind of ointment. The hair was short, black and curled, and with difficulty could be eradicated. In general nothing but naked bones can be found on laying open the mummies brought from Egypt; the cavities are filled with mould, and tendons and skin are occasionally found adhering to the limbs.

Honey was also used for embalming. If we credit the account of a Roman poet, the body of Alexander the great was embalmed in honey. A very creditable Arabian traveller, Abdollatiph, tells us, that during a search for treasure, near the pyramids, an oblong close vessel was found. On being opened it appeared to be filled with honey, of which all the company ate. Some one of them observed hairs sticking to his fingers, and on examination the box was found to contain a young child, with certain jewels or ornaments inclosed with its body.

The principal tombs are met with in the Lybian mountains, on the north west side of Thebes. They perforate the mountain from top to bottom, the lowest being finished in a superior manner. These dark sepulchres are the abodes of near 300

Arabs, who find it easier to carry on a traffic, by selling the original possessors of the tombs, than by exerting their energies in a more praiseworthy occupation. Dr. Madden supposes that of all the mummies in the European cabinets, there are not twenty in their original coffins: the Arabs exercising so much fraud in their dealings. They spoil a great many mummies in seeking for the jewels which were entombed with the wealthy. He gained access to their establishment, by curing one of the old troglodytes of a fever, and there he discovered that the best mummy cases being opened, the original was taken out and sold, while its place was supplied by one inferior. Mummy powder was formerly in great demand over Europe as a medicine, and as such, is still employed by the Arabs, who mix it with butter, and esteem it a sovereign remedy against internal and external ulcers. Among the many thousand mummy heads which Dr. Madden examined, he never found one whose intellectual organs were well developed,—an unfortunate circumstance for the phrenologist, when we consider the superior state of advancement the Egyptians had arrived to, in the arts and sciences.

The Guanches of the Canary islands, also embalmed their dead. After the brain and intestines were taken out, the body was washed with an infusion of pine bark, anointed with butter or grease, boiled with particular aromatic herbs, and exposed to the sun. Being well dried, the same operation was repeated, and subsequent drying, until the body was completely impregnated with the aromatic infusion; when it was wrapped in 3 layers of buckskin or tanned goatskin; in some instances the skin in which the body was wrapped, was untanned, with the hair still adhering to it. A mummy from Teneriffe weighed thirty pounds, and the body of Robert Braybrough, Bishop of London, who died in 1404, weighed nine pounds, 270 years after his death. The most perfect mummy which was ever discovered, was dug up in the province of Auvergne, in France. While some workmen were employed in digging, they found, a few feet under ground, a stone slab seven and a half feet long, three and a half broad and three feet high. On raising the top slab, they discovered a leaden coffin four feet long, with two holes in the top, which were filled with an unctuous substance. On raising the lid, they found a body enveloped in a coarse linen. The face was soft and white, appearing as though the person had deceased but a few days before. The teeth, ears and hair were all perfect, and the joints pliable. The intestines were soft and perfect, and the chest could be raised and depressed like a pair of bellows. In the coffin a quantity of asphaltum was found, and it is supposed the substance made use of in connexion with this, was an inward application of petroleum, from the circumstance that both these substances are found abundantly in that district of country. This mummy was inclosed in a glass case, and sent to the king's cabinet in Paris.

Within a century past, a gentleman in London, had his wife embalmed, for the purpose of enjoying an estate which he was entitled to "as long as she remained upon earth."

The bodies of travellers have been found in a state of preservation, after having been buried in the sands of Africa for a long period. The extremes of heat and cold have both the property of preserving bodies from decomposition; the first, by drying up the fluids of the body, and the last by congealing them. But they will not be preserved if the temperature alternates. Chardin states, that the bodies which have been first embalmed and then buried in the sands of Persia, are found to petrify and become extremely hard, and are preserved for several ages. The Egyptian hills are very dry, and quickly absorb the moisture from any body which is buried in them. The ancient inhabitants of Peru embalmed their dead.

In a large morass, in the isle of Axholm, Lincolnshire, the body of a woman was found, bent together, with the hands and feet in contact. From the figure of her sandals, and other circumstances, it was conjectured her death occurred 400 years previously. We might relate many accounts of a similar nature. It is not only flesh that is thus preserved. Trees and vegetables are not unfrequently found in a state of complete preservation, after having been buried for a long time.

WATER SPOUTS.

Water Spouts are one of those phenomena which nature so frequently makes use of, to expound her unwritten laws to the comprehension of a wondering world. Replete with all the majesty and grandeur that universally characterize her works, it is an exhibition we may well pause to contemplate and admire, while it calmly measures its stature to the clouds, amid the imposing silence which surrounds it, or under the the less auspicious influence of the raging tempest, breaks a passage through the conflicting elements, and spreads unsparing desolation around.

The first indication of a water spout, is an unusual disturbance on the surface of the water, extending sometimes over an area of several hundred feet in diameter. In the centre of this area the water rises up as though boiling, to a greater or less extent, according to the activity of the causes which are operating; while the surrounding parts assume a very irregular and whirling motion. Immediately above, a dark cloud is generally, but not always located. Soon after the disturbance on the water takes place, a section of this cloud, called the spout, drops down till it sometimes reaches it, and has the appearance of an inverted speaking trumpet. Within the axis of the spout the water is supposed to ascend with a rotatory motion, till its centrifugal force overcomes the action of the whirl, and causes it to fly off in all directions in parabolic curves, and mingle with the clouds above in the form of vapour. The size of water spouts is various, frequently changing so much in the same spout, that at one moment the base will be larger than any other part, and at the next smaller.

The period of their continuance is also fluctuating; while some appear and disappear in the course of a few moments, others continue for the space of five and twenty, or thirty minutes; one has been heard of, that continued for a whole hour.

Some writers have supposed the water to descend from the clouds to the sea, being at a loss to discover by what means such a large body of it could be conveyed to the upper regions of the atmosphere, and why in case of ascending, such an extensive noise should be produced, as universally accompanies them. The identity of water spouts and whirlwinds has also been discussed, as the only assignable difference between them is, that the former is generated over water, aud the latter over land. The best, and indeed, the only satisfactory way of accounting for these phenomena, is by a reversion to facts. It is to be regretted, however, that the accounts of mariners and others, who have had frequent opportunities of observing them give us but little else than a history of their exertions to keep out of the reach of these prowling navigators.

The following account of a water spout extracted from Dampier's voyages, will give an adequate idea of the power of these mighty engines;—

"Sometime in, or about the year 1674, when one Capt: Records, of London, bound for the coast of Guinea, in a ship of 300 tons, and sixteen guns, called the Blessing, came into latitude of seven or eight degrees north, he saw several spouts, one of which came directly towards the ship, and he having no wind to get out of the way, made ready to receive it by furling the sails. It came on very swift, and broke a little before it reached the ship, making a great noise and raising the sea round it, as if a great house, or some such thing, had been cast into the sea. The fury of the wind still lasted, and took the ship on the starboard bow with such voilence that it snapt off the bolt sprit and foremast both at once, and blew the ship along ready to overset it, but the ship

did presently right again, and the wind whirling round took the ship a second time with the like fury as before, but on the contrary side, and was again like to overset her the other way. The mizen mast felt the fury of the second blast and was snapt short off, as the foremast and bolt sprit had been before. The main mast and main top mast received no damage, for the fury of the winds (which was presently over) did not reach them. Three men were on the foretop when the foremast broke, and one on the bolt sprits, and fell with them into the sea, but all of them were saved."—*Dampier*, Vol. I. p. 451.

There has not been much evidence given that water spouts discharge the element from the clouds, instead of conveying it there. The principal objections against the ascending theory are, that any natural force is altogether insufficient to raise so heavy a body of water as the spout sustains; hundreds of tons being sometimes discharged when one is broken. Even admitting that a perfect vacuum is formed in the axis of the whirl, a solid column of water could not ascend within it to a greater distance than thirty-three feet, and would contain a quantity totally insufficient to form the various phenomena that are attendant on spouts of an ordinary size, and which, being equally disseminated in drops through the vacuum, from the sea to the clouds, would not present that dense appearance which water spouts have. All these difficulties, it is said, would be overcome, when the water is in a descending state. These objections might be urged, when no counteracting evidence could be adduced. But the force which water spouts and whirlwinds exert, is almost incalculable. The latter have been known to raise whole houses from their foundations, and convey them in the air to an incredible distance. One which appeared near Columbus, Ohio, on 22d May, 1830, passed through the neighboring forest, extending about 100 yards wide, and in its course either tore up, or broke off every tree, as completely as any sturdy disciple of the plough could have done, in as many years, as it occupied minutes in performing. Emerging into a section of the country which had been cleared of its lumber, it proceeded toward a small village, where it deprived several houses of their roofs, and carried off some of the furniture to supply the necessities of a neighborhood fifteen miles distant: an old family bible was among the enumerated articles sent upon this distant and useful mission.

It is not contended that a solid body of water is raised from the sea to the clouds. To perform this, would require a greater force of wind than nature has ever yet put into requisition. But that it is possible, through the agency of an ascending circular current of air, for a column weighing several hundred tons, to be sustained within it, is not to be doubted. The solid column may rise but twelve or fifteen feet, and the powerful friction of the surrounding air on this, would be abundantly sufficient to separate its particles, and convey them in a dense and continued stream to the region of the clouds, with which they would commingle in the form of vapor.

It is also said, if water spouts ascend, and convey the sea water to the clouds, salt rains must occur in or near the district where they are produced. But air has no attractive properties for salt: as soon therefore, as sea water would be subjected to its influence, in the form of drops or vapor, it would absorb the water, while the salt would be precipitated into the sea again.

In a descending spout, the whirl must commence in the region of the clouds, and take a progressive motion downward; after reaching the water, it redounds and flies off in all directions, thus causing a wind blowing from the spout. Franklin states, that an intelligent whaleman of Nantucket informed him, that while searching for whales, three of their vessels were becalmed, lying about a league distant, and forming a triangle. After some time a water spout appeared near the middle of the triangle, a brisk breeze sprung up, and every vessel made sail; it then appeared to them all by the setting of the sails, and the course each vessel stood, that the spout was to the leeward of every one of them; and they all declared it to have been so, when they afterwards came to confer about it in company: a very substantial evidence that it was not a descending spout.

A water spout occurred at Mont Congreve, at the extremity of the long branch, on July 19th, 1811, whose diameter was equal to the breadth of the river, and such was its power, that the bed of the river was rendered plainly visible.

On the Wednesday before Easter, 1696, a shower of small fishes fell at Cranstead, near Wrotham, in Kent. They could not have ascended to the clouds very conveniently, by any other medium than through a water spout.

Though most of the accounts we have of water spouts, clearly prove they ascend, yet there is no doubt many act in a contrary direction. Some of our heaviest showers are produced by a sudden condensation of the atmosphere above. If a whirlwind be produced by condensation, the rain would be drawn to the centre of the whirl, and descend in a column of a few feet in diameter; whereas, by ordinary atmospheric phenomena, it would be diffused in the form of a shower, over a surface of several square miles.

Captain Langstaff, on a voyage to the West Indies, had one to come across the stern of his vessel, and pass off. The water came down in such quantity that it almost drowned one of the sailors.

On July 18th, 1815, a spout occurred at Langenseibza, which caused an inundation of water several inches in depth, over a hundred acres of land.

Some have supposed water spouts to be of an electric origin. Cavallo however, remarks, that the lightning and other electric phenomena, appear to be rather the necessary consequence of the causes which produce water spouts. [*To be continued.*

THE ADVOCATE OF SCIENCE.

Philadelphia, Fourth Month 18, 1833.

An important error occurred in printing the lecture on Natural Science in our last number. The date of our earth, according to Buffon, is there stated at 9600 instead of 96000 years, and the period of cooling to support life at 4300 instead of 43000 years.

For the Advocate of Science.

PRIZE TALE!

Mr. Advocate,—It is one of the main articles of my creed, that the system of *prize tales*, as practised in this country and elsewhere, is far from being useful. It excites the imagination of youthful aspirants to fame, and diverts the mind from the pursuit of profitable knowledge; thus creating a capricious and depraved taste, and giving rise to what might be termed *puppy* literature. Numbers of young persons are thus taken from the paths of science, and induced to write before they have read, in order to gratify a vain passion for notoriety. Should they succeed in their first attempt, they are probably spoiled for life; as it would be a waste of time to learn after having ascertained one's capacity to instruct others, and to flourish in the columns of a newspaper.

These ideas were suggested by looking over one of these "prize tales," lately published, to which my attention was drawn by a very laudatory introduction, written by the editor of the paper it was published in. The tale professed to be founded on incidents connected with the American revolution, and gave a description of the inhuman treatment of an Irish robber, by the natives of a neighboring state—a description too unnatural for credulity to believe, and charging on some of our countrymen a brutality that would disgrace barbarians. The writer also pretended to picture some of the peculiarities of the quakers, which he has most ignorantly caricatured.

As you would doubtless find it useful for your paper to publish an occasional prize tale, I feel disposed to furnish you with a form of advertisement, so as to procure some of these choice productions of mushroom genius. I propose the following:—

To all literary Calves, and literary Puppies. Prize Tale!
One Dollar Premium!

The editor of this paper offers the above reward to the writer of the best original tale, founded on some true historical incidents connected with the life of Baron Munchausen, or Thomas Thumb. The truth and fiction must be so ingeniously blended, as to prevent the detection of the falsehood. The character of an Indian or negro, who cannot speak good English, would be considered an addition to its value; but most of the other characters must speak grammatically, and use but little profane language. This proposition affords to enterprizing young gentlemen and ladies, an opportunity rarely equalled in other countries, to exhibit their talents, and get their names printed in at least fifty newspapers. The editor makes the offer in pure public spirit, being desirous to bring out the native genius which abounds in the great and growing republic of the United States of North America.

N. B. If the successful competitor should be wealthy, and not stand in need of the sum to which he is entitled, he shall receive a copy of the "Children of the Abbey," a medal of lead with his name inscribed thereon, to hang about his neck, and a profile likeness of himself, neatly cut in paper, by one of the first artists of the age.

MOSES.

Our facetious correspondent "Moses," has touched on a subject which he might profitably continue to discuss. We believe with him, that the practice of offering rewards for the cobweb effusions of juvenile fancy, is very injurious. It requires much less labour to sit in a garret, or some romantic corner, and indulge the imagination in fabricating love stories, ghost stories, murder stories, and innocent rhymes, than to exercise the perceptive and reflecting faculties, on the objects of real and useful knowledge. It is also a short cut to distinction and notoriety. The prevailing itch for writing, stimulated by the prize system, is a kind of intellectual dissipation or inebriety, which impairs and destroys the rational faculties, as certainly as intemperance does the bodily powers. We hope to hear again from "Moses," though we would suggest to him the use of milder terms, instead of the caustic style which he has assumed.

Reply to the questions of Barbara.

"Why does a north-west wind make ice, when the atmosphere is several degrees above the freezing point, while an easterly wind thaws, even when it is colder?"

This question is easily answered by a reference to the effect of evaporation in producing cold. A wind from the north-west is commonly very dry, and causes a very rapid evaporation of moisture from the earth's surface. But an easterly wind is as uniformly loaded with aqueous vapors, often causing it rather to impart than absorb the moisture of the earth. We have seen ice formed when the temperature of the air was five or six degrees above freezing. But this takes place only when there is a dry wind causing rapid evaporation. The effect of evaporation in producing cold, is very sensible on simply wetting the hand, and then exposing it to the air. It is on this principle, that a seaman wishing to ascertain the direction of a very light wind, wets his finger in his mouth, and afterwards holds it above his head in the open air. The side against which the wind blows, perceives the cold at once.

The property of absorbing heat in passing from a liquid to a gaseous form which water possesses, is a source of much comfort to us in the warm weather of summer. It is well known that those persons who perspire freely, suffer least from heat; because the skin is continually bedewed with sweat, which cools the body in evaporating. Hence the surface of our bodies is often actually cooler while we are panting in an atmosphere of 90 degrees, than it is in winter, while we are crowding around the fire.

A common method of cooling water, in the West India islands, is to wrap the jug which contains it in a wet cloth, and expose it to the sun and air; the consequent rapid evaporation refrigerates the jug. By employing a liquid more easily evaporated than water, the frigorific effect is still more perceptible—alcohol, for instance, or ether. By holding the bulb of a thermometer in the noon-day sun, in summer, and dropping a small stream of sulphuric ether upon it, at the same time that an artificial current of air is directed on the bulb from a bellows, the mercury may be reduced in a minute or two, from 120° or 140° to 33° or 34°—within one or two degrees of the freezing point.

"In what way does a fall of snow act in producing extreme cold?"

It is a very common idea that snow produces cold; but it is a very erroneous one. True, intense cold is apt *to follow* a fall of snow, but it is dependant on the same cause as the snow itself, i. e. a change in the temperature of the air, commencing in the upper regions. Snow is formed at or below 32°, which is the freezing point. If the stratum of air which freezes the cloud, so as to produce snow, be below 32°, the congelation of the water into snow, instead of causing cold, tends to raise the temperature of the air, because liquids always part with a portion of heat in the act of freezing. Thus the formation of snow, when it has any sensible influence on the temperature of our climate, must tend to moderate, rather than increase the cold.

A bed of snow chills the superincumbent air, if that air be warmer than 32°; but it cannot sink the thermometer below the freezing point. Therefore, although a body of snow cannot have any agency in causing the intense cold of winter, yet it may, and often does, by abstracting the heat of the air while thawing, chill the breezes of spring.

The temperature of snow is sometimes considerably below 32°; but in this case it must have been refrigerated by passing through a stratum of cold air somewhere between the clouds and the earth. Should this stratum, as frequently happens, afterward descend to the surface, a rapid fall in the temperature of the atmosphere is the consequence; and this is liable to be regarded by a superficial observer as the effect of the snow.

The other question with regard to the circle of the sun and moon, requires some development of the laws of refraction and will be explained in our next number.

JOURNAL OF THE WEATHER,

for 3d Month, March, 1833, kept at Wilmington, Del.

Days Month.	THER'M. Sunrise.	THER'M. Mid-day.	THER'M. 11 P. M.	BAROMETER. Sunrise.	BAROMETER. Mid-day.	BAROMETER. 11 P. M.	WIND. Morning	Force.	WIND. Aft'noon.	Force.	WIND. Evening	Force.	OBSERVATIONS.
1	22	23	20	29.71	29.69	29.60	N.E.	2	N.E.	2	N.	2	Snow, 5 in.
2	17	15	6	.70	.80	30.03	N.W.	5	N.W.	5	N.W	3	Partly clr.stormy.
3	4	25	23	30.03	.82	29.62	S.W.	2	S.W	2	W.	2	Partly clear.
4	19	24	14	29.80	.92	30.13	N.W.	3	N.W.	3	N.W.	1	Clear.
5	8	31	20	30.21	30.08	29.85	N.E.	1	S.	1	S.	1	Clear, cldy, sno.
6	22	35	29	29.65	.72	.90	N.	1	N.W.	4	N.W.	2	Snow, clear, 3 in.
7	13	40	30	.91	.84	.70	E.-S.	2	S.	2	S.	1	Clear.
8	28	45	37	.60	.51	.50	S.S.E.	1	S.-E.	1	N.E.	0	Partly clear.
9	30	44	32	.57	.58	.65	N.E.	1	S.	2	W.	1	Clear. 0.2 in.rain
10	32	49	38	.75	.79	.82	S.W.	1	N.E.	1	E.	0	Clear, cldy, rain
11	30	48	37	.95	.96	.97	N.E.	1	E.	1	S.	0	Clear, foggy.
12	32	36	36	.99	.85	.75	S.E.	1	E.	1	S E.	0	Cldy, fog, r. l.& t.
13	35	38	29	.80	.90	30.08	N.W.	3	N.W.	3	N.W.	2	Clear.
14	24	38	3.	30.25	30.15	.05	E.	1	S.E.	2	S.	2	Clear.
15	35	50	36	29.95	29.95	.08	N.	1	N.W.	1	N.	1	Cloudy, clear.
16	36	50	35	30.09	30.15	.25	E.	2	S.E.	2	S.	1	Clear.
17	30	48	33	.30	.25	.20	E.	2	S.	2	E.	1	Thin cloud.
18	32	53	45	.35	.30	29.95	E.	2	S.	2	S.W.	0	Partly clear.
19	42	65	54	29.90	29.87	.85	S.W.	1	S.W.	2	S.	1	Clear, cldy, rain.
20	54	60	58	.82	.75	.72	S.	1	S.W.	2	S.	2	Cloudy, r. .50 in.
21	54	64	56	.62	.58	.45	S.W.	1	S W.	2	W.	1	Cldy.clr,r. aurora.
22	50	60	48	.50	.52	.67	N.W.	3	N.W.	3	N.W.	3	Clear.
23	40	58	46	.79	.79	.77	E.	1	S.	1	S E.	1	Clear.
24	38	60	45	.72	.63	.49	S.E.	1	S.E.	2	E.	2	Cloudy.
25	42	58	46	.40	.42	.50	N.W.	2	N.W.	3	N.W.	2	Clear.
26	33	48	38	.61	.67	.82	N.W.	3	N.W.	3	N.W.	1	Clear.
27	28	48	39	.88	.84	.81	W.	1	W.	1	N.N.E	2	Cloudy.
28	28	42	36	.92	.84	.73	N.N.E	2	N.N.E	1	N.N.E	1	Cloudy.
29	30	48	36	.69	.52	.69	N.	1	N.W.	2	N.W.	2	Cloudy, clear.
30	30	50	43	.72	.85	.91	N.W.	3	N.W.	3	W.	1	Clear.
31	35	58	48	.99	.80	.90	N.W.	2	N.W.	2	W.	1	Clear except haze

SUMMARY.

Average at sunrise, thermometer	31°.06	barometer	29.85	inches,	
Do. at mid-day,	do.	45°.19	do.	29.82	do.
Do. at 11 P. M.	do.	36°.35	do.	29.82	do.
Monthly mean, two obs.	do.	38°.125	do.	29.83	do.
Maximum, (19th,)		65°	do. 18th	30.35	do.
Minimum, (3d)	do.	4°	do. 25th	29.40	do.
Range,	do.	61°	do.	.95	do.
Warmest day, 21st,	do.	59°			
Coldest day, 3d,	do.	14½°			

Northerly Winds prevailed, (proportion,)	12 days	Whole days clear,	12 days.
		Days on which rain fell,	4
Easterly, do.	7 do.	Days on which snow fell,	3
Southerly, do. S. to W.	12 do.	Quantity of rain,	0.82 in.
Proportion of clear weather,	16 do.	Quantity of snow,	8 inch.
Proportion of cloudy do.	15 do.	Quant. of water,(rain & snow)	1.82 inch.

Observations.—An aurora borealis on the 21st, followed by easterly winds, and an incomplete easterly storm, in three days. Clouds electrified once, on the 12th. Several incomplete and transient easterly storms, with little or no rain. A complete one on the 1st of the month, being a continuation of the snow storm which commenced on the 28th of last month.

The beginning of this month was the exact counterpart of the remainder. The first week was severe winter weather, colder than has occurred in March for many years. On the first 14 days, the thermometer was above the freezing point at sunrise only once, and averaged about 22 degrees. On the remaining 17 days, it was *below* that point at sunrise only five times, and averaged 37 degrees. At the end of the month, the roads had become dry and dusty, and the farmers were complaining for the want of rain. The spring was backward, vegetation just starting with the few warm days previous to the 26th.

The days marked "clear" in the journal, were seldom *entirely* clear, although this term is employed in its common acceptation. Those who have not particularly observed, are not aware how rarely the sky is completely cloudless for any length of time, in the winter season. On the 30th of the month not a cloud was visible through the day. The same cannot be said of any previous day since the thirteenth of the eleventh month, 1833. Indeed, during the intervening period, there occurred only two days on which the sky was without a speck of cloud for six hours together, between sunrise and sunset. But, although not a single *perfectly clear* day happened for a space of four months, and more, there were forty entire days meanwhile, to which the term *clear*, in its common sense, is strictly applicable; beside a larger number partially clear. Thirty only of the 135 days referred to, were *completely* cloudy.

MISCELLANIES.

1. *Sunflower Oil.*—The seed of the common sunflower of our gardens (HELIANTHUS *annuus*) contains a large quantity of oil, adapted for many useful purposes. For painting it is said to be superior to linseed oil, drying sooner, and imparting a fine gloss. It is highly praised for table use, as a substitute for olive oil. It burns well in lamps, without any offensive odor. The plant may be cultivated in the same manner as corn. An acre of good corn ground will yield fifty bushels or more of sunflower seed, and one bushel of the seed furnishes a gallon of oil. The expression of the oil is effected by the same process as that of linseed, except that the sunflower seed requires to be previously hulled. This is done by a machine invented a few years ago, by Charles A. Barnitz, of York, Pa. If mills were erected similar to grist mills, purposely for the manufacture of this oil, the cultivation of the plant would be well worthy the attention of our farmers. An acre of ground will produce quite as many bushels of sunflower seed as of corn, with less labor. Every bushel will yield a gallon of oil, worth at least a dollar. The cake from which the oil has been expressed is an excellent article of horsefeed, and will nearly pay the expense of pressing. And the oil is a good substitute for linseed, olive and sperm oil.

2. *Cholera.*—Although this subject does not strictly appertain to the province of our paper, we may be allowed to state the fact, copied from some of the English papers, that the cholera has not visited any of the watering places in England. Why it has thus avoided the localities of mineral springs, is a question for curious inquiry. Now that the warm weather approaches, and some apprehension is felt of a return of the pestilence, many of our newspapers have discovered that the disease prevails to the south-west, and they begin to hunt up paragraphs on the subject. The truth is, that the cholera has never left the United States, but has been held in check by the winter, according to its custom, and is now resuming its line of march. Judging from the past, it will not travel *backwards* over its old route, but if it returns at all, will first appear in Canada, or some where to the north, as it did last year.

3. *Swimming.*—We often feel inclined to envy the superior ability of the finny tribe in this exquisite art. Notwithstanding it imparts to the system additional vigor, and proves a perfect safeguard against the innovations of many diseases, yet still must we regret seeing it treated with so much indifference by our citizens, and with total neglect by our ladies. Were we to suggest to some of the latter, a proposition to *learn* and to *practice* the art, they might, perchance, think our cranium not altogether as sound as their own; and we may lose our credit for veracity, in spite of our good authority,* if by way of a stimulant, we tell that the Egyptian girls are so fond of it, that they may be seen in flocks, swimming from village to village, with all the dexterity of the fabled nymphs. As for the men, they occasionally float down the river on their backs, with a cup of coffee in one hand, a pipe in the other, and their feet tied together with an iron chain.

4. *American Steamboats.*—The Jan. number of Silliman's Journal, contains an interesting article on this subject, by W. C. Redfield, of New York. The writer states, that in 1827, the quickest passage from New York to Albany was in twelve hours; the distance being 150 miles. In 1829, the passage was accomplished in ten hours and thirty minutes—in 1831, in ten hours and fifteen minutes—all the stoppages being included in these statements. But in 1832, the passage was accomplished in nine hours and eighteen minutes; averaging sixteen miles an hour. The aid derived from the tide is estimated at one mile per hour, on an average. There are ten boats for the conveyance of passengers between New York and Albany, the largest of which has a deck 232 feet long, and 64 wide across the guards. The great cabin of this boat (the *De Witt Clinton*,) is 175 feet in length, and the draught of water not more than four feet six inches. The power with which she is propelled, is estimated as equal to the power of from 600 to 700 horses! Three of the others also, measure upwards of 200 feet in length. The writer compares the number of deaths from steam explosions, with the number caused by lightning, and finds the deaths by steam in the United States, to average fifteen a year, while twenty six deaths are known to have occurred from lightning last year. The timid may therefore console themselves by reflecting, that when they are not in the neighborhood of a steam boiler, their lives are more in danger from thunder gusts, than from steam.

5. *Caoutchouc.*—Few persons are perhaps aware of the comparatively late introduction of Indian Rubber into this country. The following notice is appended by Dr. Priestly to the preface to his *Familiar Introduction to the Theory and Practice of Perspective*, printed in 1770; and it will be observed that no name is given to the substance described: "Since this work was printed off, I have seen a substance excellently adapted to the purpose of wiping from paper the marks of a black lead pencil. It must therefore be of singular use to those who practice drawing. It is sold by Mr. Nairne, Mathematical Instrument Maker, opposite the Royal Exchange. He sells a cubical piece, of about half an inch, for three shillings; and he says it will last for several years."—*Phil. Mag. & Jour. Phil. Col. of Pharm.*

6. *How to accelerate the boiling of an Egg.*—Darwin states, that an egg is hardened much sooner in water boiling violently than slowly. It is known that water cannot be made any hotter in the open air, after it has reached the boiling point—the excess of heat being employed in the formation of steam. The author ascribes the effect on the egg, to the greater quantity of heat passing upward through the liquid, when the boiling is active.

* Malte Brun.

7. *To change the shape of a melon.*—A lopsided melon is said to resume the round form, if its stem is stretched over a forked stick while growing. The inequality of the fruit, is perhaps caused by an imperfect circulation through one side of the stem, which is remedied by stretching it.

8. *Evolution of gas from putrefaction.*—The formation of gas by putrefaction in bodies buried, and thus excluded from the open air, I have seen to raise the lid of the coffin, though covered with half a foot of earth.—*Bichat.*

9. *Gastronomy of the Mole.*—The common earth worm, (*lumbricus,*) which boys string on their hooks in fishing, is one of the chief articles of food to the mole. Our subterranean epicure makes a hole in the skin of the worm, and sucks out the contents, rejecting the skin.

10. *Proofs of diversity of species in the human family.*—A noted German professor, believed the Caffres or Hottentots to be a distinct species, because they never have colds or catarrhs,—never sneeze, cough, yawn or hawk! If this tale be true, they are a very good breed, and might be introduced advantageously into our climate of influenza and consumption.

11. *Novel mode of hatching fish in the Celestial Empire.*—To hatch ducks and birds under domestic fowls, is a common expedient; and most persons are aware of the alarm with which a hen regards the aquatic propensities of her adopted children, the ducklings. But the Chinese have taken the lead in such matters, by hatching fish under fowls! In Turner's Sacred History of the World, No. 32, of Harper's Family Library, (by the way, a very entertaining and useful book,) the process is described. They collect from rivers and ponds the gelatinous matter which contains the eggs of fish, put it into vessels, and sell it to the proprietors of ponds. A fowl's egg is emptied of its usual contents, and this gelatinous matter is put in. The opening is then hermetically sealed, and it is put under a setting hen. After some days the egg is opened, and placed in a vessel of water heated by the sun. This is kept in his rays till the little fish become strong enough to bear the external temperature, when they are thrown into the pond.

12. *Improvement in the quality of Iron & Steel.*—An eminent London cutler, Mr. Weiss of the Strand, to whose inventions modern sugery is under considerable obligations, has remarked, that steel seemed to be much improved when it had become rusty in the earth, and provided the rust was not factitiously produced by the application of acids. He accordingly buried some razor blades for near three years, and the result fully corresponded to his expectation; the blades were coated with rust, which had the appearance of having exuded from within, but were not eroded, and the quality of the steel was decidedly improved.—*Phil. Mag. & Jour. Phil. Col. of Pharm.*

13. *Effect of sea water on vegetation.*—After an inundation of Friesland, in 1825, the oak, mulberry, pear and peach trees, and deep rooted ones, did not suffer; nor the asparagus; the onions, pumpkins, celery and some others, were never finer. But the vines and gooseberries contracted a salt taste, and the apricots, apples, cherries, poplars, elms, beech and willows, could not stand it. They pushed out a few leaves, and then declined.—*Turner's Hist. in Family Library.*

This fact supplies a hint in relation to the consequence of pouring brine about trees of some particular kinds.

14. *New variety of the human species.*—The London Medical Gazette gives an account of a man in St. George's Hospital, who has no patella or knee pan, in either leg. The knee looked rather flatter that usual, but no apparent evil results from this anomalous formation, as the man says he can walk many miles a day without difficulty. The use of the patella is to afford a moveable, pulley-like attachment to the muscles on the fore part of the thigh, which straighten the knee joint. The muscles are fastened to the upper part of the patella, while the lower side of that bone is firmly fastened to the upper end of the bone of the leg. In the man spoken of, its place is probably supplied by a cartilage, or by a tendenous expansion, which serves the same purpose. The peculiarity is said to be hereditary, as the father and grandfather of the man exhibit the same deficiency, and also other members of the family. With proper care, a race of this kind might probably be established, forming a new variety of the species, with claims to a distinct origin or a difference of species, quite as strong as the claims of the African, Mongolian, or any other acknowledged variety.

15. *Air plant of China, or Epidendron,* Flos æris.—Thisis one of the most curious productions of the vegetable kingdom. It has no root and lives entirely in air, absorbing nutriment by means of its foliage. This nutriment consists in part of the moisture which the atmosphere constantly holds in solution. The plant is famous for the beauty of its flowers and the sweetness of its perfume. The Chinese suspend it round the ceiling of their rooms. Prince Leopold once obtained a branch three feet long, containing some hundreds of large scarlet and yellow flowers.

16. *Teachability of fish.*—In the Polynesia Researches is an account by Ellis of the taming of eels in Otaheite. He says that "eels are great favorites in that island, and are tamed and fed until they attain an enormous size. These pets are kept in large holes, two or three feet deep, partially filled with water. On the sides of these pits they generally remain, except *when called* by the person who fed them. I have been several times with the young chief, when he has sat down by the side of the hole, and by giving a shrill sort of whistle, has brought out an enormous eel, which moved about the surface of the water, and eaten with confidence out of its master's hand." Some old carp in an European fish pond, are described by a veracious traveller, as so tame, that when any one approached their pond, they came to the shore in such numbers and eagerness, as to push each other out of the water, and as if asking for the bread that was given them. The carp in the king of Prussia's garden, came to the shore in the same way, in order to be fed. The golden carp, or gold fish, are kept in ponds in China, where they are regularly fed, and taught to rise to the surface at the sound of a bell, in order to receive their nourishment. A farmer in England, had a trout twenty seven years old in his well. His family became fond of it, and it would frequently eat worms out of the childrens' hands; but if a stranger came, it would hide in a small hole for the rest of the day. A pike has been known to become so tame, as to follow the waving of a handkerchief to any part of its pond.

17. *Living Toads enclosed in stone & wood.*—In order to ascertain the effect of enclosing living toads in stone and wood, Professor Buckland, of Oxford, (Eng.) performed some curious experiments, detailed in the last number of Silliman's Journal. Twelve cells were made in a hard compact sandstone, and as many in a coarse porous Limestone, into each of which a live toad was placed, and covered in from the action of the atmosphere. A year afterwards the cells were opened and examined. The toads in the sandstone were dead and in a state of putrifaction. But most of those in the limestone (which was permeable to water and probably also to air, owing to its porosity) were alive, one of them had diminished in weight 226 grains, and another 284 grains. Two of the animals had increased in weight about 100 grains, each, owing, it was supposed, to the entrance of minute insects through the covering, or the pores of the limestone. Before the end of the second year, however they all died.—Four toads were enclosed at the same time in wood, but they soon died.

From these and some other experiments, Dr. Buckland concludes that toads cannot live when totally excluded from the action of air or the ingress of minute insects which serve for their food—that they are only *partially* imprisoned when found alive in cavities of rock and wood, into which they have taken refuge and remained till they become too large to escape by the aperture.